

LISTING OF THE CLAIMS:

This listing of the claims is provided for the Examiner's convenience, as no claims have been amended, canceled or added in the present response.

1. (Previously presented) An implantable cardiac lead, comprising:

a lead body;

a cardiac electrode supported by the lead body, the electrode configured for subcutaneous, non-intrathoracic placement within a patient and for one or both of cardiac monitoring and cardiac electrical stimulation;

one or more conductors coupled to the cardiac electrode and disposed within the lead body;

a pharmacological agent provided along at least a longitudinal portion of an exterior surface of the lead body; and

a driving arrangement coupled to the lead, the driving arrangement configured to provide phoresis delivery of a pharmacological agent from the longitudinal portion of the exterior surface of the lead body to subcutaneous tissue.

2. (Previously presented) The lead according to claim 1, wherein the driving arrangement comprises the electrode supported by the lead body.

3. (Original) The lead according to claim 1, wherein the driving arrangement comprises a transducer adapted to provide sonophoresis.

4. (Original) The lead according to claim 1, wherein the electrode is configured as an electrode array, and the driving arrangement comprises the electrode array.

5. (Original) The lead according to claim 1, wherein the driving arrangement comprises a conductor adapted to provide electrophoresis.
6. (Original) The lead according to claim 1, wherein the pharmacological agent provides therapeutic treatment localized to an area substantially surrounding at least a portion of a subcutaneous dissection path.
7. (Previously presented) The lead according to claim 1, wherein the pharmacological agent is provided at least along a plurality of longitudinal portions of the exterior surface of the lead body.
8. (Previously presented) The lead according to claim 1, wherein the pharmacological agent is impregnated into a membrane provided along the longitudinal portion of exterior surface of the lead body.
9. (Previously presented) The lead according to claim 1, wherein the lead further comprises a collar provided along the longitudinal portion of the exterior surface of the lead body, the pharmacological agent provided at the collar.
10. (Previously presented) The lead according to claim 1, wherein the lead further comprises a polymeric structure provided along the longitudinal portion of the exterior surface of the lead body, the pharmacological agent infused within the polymeric structure.
11. (Previously presented) The lead according to claim 1, wherein the lead further comprises a porous region provided along the longitudinal portion of the exterior surface of the lead body, the pharmacological agent at least partially filling pores of the porous region.

12. (Original) The lead according to claim 11, wherein the porous region comprises a doped polymer matrix.

13. (Previously presented) The lead according to claim 1, wherein the pharmacological agent is disposed in a coating provided along the longitudinal portion of the exterior surface of the lead body.

14. (Original) The lead according to claim 1, wherein the pharmacological agent comprises an analgesic or an anesthetic.

15. (Original) The lead according to claim 1, wherein the pharmacological agent comprises an antibiotic or an antiseptic.

16. (Original) The lead according to claim 1, wherein the pharmacological agent comprises a steroid or an anti-inflammatory agent.

17. (Original) The lead according to claim 1, wherein the pharmacological agent comprises an agent that promotes hemostasis or provides vasoconstriction.

18. (Previously presented) An implantable system, comprising:

a lead, comprising:

a lead body; and

a cardiac electrode coupled to the lead body, the electrode configured for subcutaneous non-intrathoracic placement within a patient and for one or both of cardiac monitoring and cardiac electrical stimulation;

a can coupled to the lead; and

a pharmacological agent provided on a portion of an exterior surface of the can, wherein the can is configured to provide phoresis delivery of the pharmacological agent from at least the portion of the exterior surface of the can to subcutaneous tissue.

19. (Original) The system according to claim 18, wherein the can is configured to provide electrophoresis.

20. (Original) The system according to claim 18, wherein the can is configured to provide sonophoresis.

21. (Original) The system according to claim 18, further comprising a driving arrangement provided on the lead and configured to provide phoresis delivery of a pharmacological agent from at least a portion of the lead to the subcutaneous tissue.

22. (Original) The system according to claim 18, wherein the lead and the can are configured to produce an electric potential between the lead and the can, the electric potential produced to provide the phoresis delivery of the pharmacological agent.

23. (Previously presented) The system according to claim 18, wherein the pharmacological agent is impregnated into a membrane provided on the portion of the exterior surface of the can.

24. (Canceled).

25. (Previously presented) The system according to claim 18, wherein the can comprises a porous region on the portion of the exterior surface, the pharmacological agent at least partially filling pores of the porous region.

26. (Original) The system according to claim 25, wherein the porous region comprises a doped polymer matrix.

27. (Previously presented) The system according to claim 18, wherein the pharmacological agent is disposed in a coating on the portion of the exterior surface of the can.

28. (Original) The system according to claim 27, wherein the coating covers at least 25% of a surface area of the can.

29. (Original) The system according to claim 18, wherein the pharmacological agent comprises an analgesic or an anesthetic.

30. (Original) The system according to claim 18, wherein the pharmacological agent comprises an antibiotic or an antiseptic.

31. (Original) The system according to claim 18, wherein the pharmacological agent comprises a steroid or an anti-inflammatory agent.

32. (Original) The system according to claim 18, wherein the pharmacological agent comprises an agent that promotes hemostasis or provides vasoconstriction.

33. (Withdrawn) A method of lead implantation, comprising:

delivering a lead into subcutaneous non-intrathoracic tissue of a patient, the lead comprising a lead body, a cardiac electrode configured for one or both of cardiac monitoring and cardiac electrical stimulation, and a pharmacological agent on the lead; and

impelling, using phoresis, the pharmacological agent from at least a portion of the lead to the subcutaneous non-intrathoracic tissue.

34. (Withdrawn) The method according to claim 33, wherein impelling the pharmacological agent comprises generating an electric field for impelling the pharmacological agent using electrophoresis.

35. (Withdrawn) The method according to claim 33, wherein impelling the pharmacological agent comprises generating ultrasonic waves for impelling the pharmacological agent ultrasonically.

36. (Withdrawn) The method according to claim 33, wherein impelling the pharmacological agent using phoresis comprises impelling a plurality of pharmacological agents.

37. (Withdrawn) The method according to claim 33, wherein impelling the pharmacological agent comprises impelling a first pharmacological agent using electrophoresis and impelling a second pharmacological agent using sonophoresis.

38. (Withdrawn) The method according to claim 33, further comprising
delivering a can into subcutaneous non-intrathoracic tissue of the patient, the can comprising an electrode or an electrically conductive region, and a pharmacological agent; and

impelling, using phoresis, the pharmacological agent from at least a portion of the can to the subcutaneous non-intrathoracic tissue.

39. (Withdrawn) The method according to claim 38, wherein impelling the pharmacological agent from the can comprises generating an electric field for impelling the pharmacological agent from the can using electrophoresis.

40. (Withdrawn) The method according to claim 38, wherein impelling the pharmacological agent comprises generating ultrasonic waves for impelling the pharmacological agent ultrasonically from the can.

41. (Withdrawn) The method according to claim 38, wherein impelling the pharmacological agent from the can using phoresis comprises impelling a plurality of pharmacological agents from the can.

42. (Withdrawn) The method according to claim 38, wherein impelling the pharmacological agent from the can comprises impelling a first pharmacological agent using electrophoresis and impelling a second pharmacological agent using sonophoresis.

43. (Withdrawn) The method according to claim 33, further comprising:
providing a removable sheath having a lumen;
advancing the lead through the lumen to an implant location; and
removing the sheath from the lead with the lead remaining at the implant location.

44. (Withdrawn) The method according to claim 33, wherein the pharmacological agent comprises an analgesic or an anesthetic.

45. (Withdrawn) The method according to claim 33, wherein the pharmacological agent comprises an antibiotic or an antiseptic.

46. (Withdrawn) The method according to claim 33, wherein the pharmacological agent comprises a steroid or an anti-inflammatory agent.

47. (Withdrawn) The method according to claim 33, wherein the pharmacological agent comprises an agent that promotes hemostasis or provides vasoconstriction.

48. (Previously presented) An implantable cardiac lead, comprising:

a lead body;

a cardiac electrode coupled to the lead body, the electrode configured for subcutaneous non-intrathoracic placement in a patient and for one or both of cardiac monitoring and cardiac electrical stimulation;

one or more conductors coupled to the electrode and disposed within the lead body;

a pharmacological agent provided along at least a longitudinal portion of an exterior surface of the lead body; and

means, coupled to the implantable lead, for impelling the pharmacological agent using phoresis from the longitudinal portion of the exterior surface of the lead body into subcutaneous non-intrathoracic tissue.

49. (Original) The lead according to claim 48, wherein the impelling means comprises means for impelling the pharmacological agent using electrophoresis.

50. (Original) The lead according to claim 48, wherein the impelling means comprises means for impelling the pharmacological agent using sonophoresis.

51. (Original) The lead according to claim 48, wherein the pharmacological agent comprises an analgesic or an anesthetic.

52. (Original) The lead according to claim 48, wherein the pharmacological agent comprises an antibiotic or an antiseptic.

53. (Original) The lead according to claim 48, wherein the pharmacological agent comprises a steroid or an anti-inflammatory agent.

54. (Original) The lead according to claim 48, wherein the pharmacological agent comprises an agent that promotes hemostasis or provides vasoconstriction.

55. (Previously presented) A system, comprising:

an implantable medical device, comprising:

a can that houses circuitry configured to provide one or both of cardiac monitoring and cardiac stimulation;

a lead coupled to the can, the lead comprising a lead body, a cardiac electrode coupled to the lead body, and one or more conductors coupled to the cardiac electrode and disposed within the lead body, the electrode configured for subcutaneous non-intrathoracic placement within a patient and for one or both of cardiac monitoring and cardiac electrical stimulation;

a first pharmacological agent provided along at least a longitudinal portion of an exterior surface of the lead body; and

a second pharmacological agent provided on a portion of an exterior surface of the can; and

a driver apparatus detachably coupled to the implantable medical device, the driver apparatus configured to facilitate phoresis delivery of at least one of the first pharmacological agent from the longitudinal portion of the exterior surface of the lead body and the second pharmacological agent from the portion of the exterior surface of the can.

56. (Previously presented) The system according to claim 55, wherein the driver apparatus facilitates electrophoresis delivery of at least one of the first and second pharmacological agents.

57. (Previously presented) The system according to claim 55, wherein the driver apparatus facilitates sonophoresis delivery of at least one of the first and second pharmacological agents.

58. (Previously presented) The system according to claim 55, wherein the lead and the can are configured to produce an electric potential between the lead and the can to provide the phoresis delivery of at least one of the first and second pharmacological agents.

59. (Original) The system according to claim 55, wherein the driver is configured to provide a phoresis power signal to the implantable medical device.

60. (Original) The system according to claim 59, wherein the phoresis power signal is a DC voltage.

61. (Original) The system according to claim 59, wherein the phoresis power signal is an AC signal alternating at an ultrasonic frequency.

62. (Original) The system according to claim 59, wherein the phoresis power signal is a DC bias voltage with an AC signal alternating at an ultrasonic frequency.

63. (Previously presented) The system according to claim 55, wherein at least one of the first and second pharmacological agents comprises an analgesic or an anesthetic.

64. (Previously presented) The system according to claim 55, wherein at least one of the first and second pharmacological agents comprises an antibiotic or an antiseptic.

65. (Previously presented) The system according to claim 55, wherein at least one of the first and second pharmacological agents comprises a steroid or an anti-inflammatory agent.

66. (Previously presented) The system according to claim 55, wherein at least one of the first and second pharmacological agents comprises an agent that promotes hemostasis or provides vasoconstriction.